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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,936	09/04/2003	Yider Wu	AMD-H0634	7017
7590 11/01/2004			EXAMINER	
WAGNER, MURABITO & HAO LLP			CHAUDHARI, CHANDRA P	
Third Floor			ART UNIT	
Two North Market Street			PAPER NUMBER	
San Jose, CA 95113			2813	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/655,936

Applicant(s)

WU ET AL.

Examiner

Chandra Chaudhari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 17-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-16, drawn to a method of making a semiconductor device, classified in class 438, subclass 264.
- II. Claims 17-23, drawn to a semiconductor device, classified in class 257, subclass 315.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such as depositing an undoped polycrystalline silicon layer instead of a doped layer and doping to form a doped layer.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Jose Garcia on September 28, 2004 a provisional election was made without traverse to prosecute the invention of group I, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art and Eom - US 5,817,547.

Applicant's admitted prior art (Figs. 1A-1B and pages 1-2 of the specification discloses substantially the claimed invention by fabricating a flash memory device with a floating gate by depositing an N-type polysilicon layer on a tunnel oxide layer, an ONO layer on the floating gate, a control gate on the ONO layer, and performing a plurality of thermal processes. The admitted prior art does not disclose to deposit an undoped polysilicon layer on the tunnel oxide and a doped polysilicon layer on the undoped polysilicon layer. Eom (Figs. 2A-2C and text in col. 3, line 46 to col. 4, line 41) teaches to form an undoped polysilicon layer 13 on gate oxide 12 (which is analogous to and thin enough to the claimed tunnel oxide), and a doped polysilicon layer 14 on the undoped polysilicon layer to form a gate. Eom states the thickness of the polysilicon layers may be adjusted as in the instant claims.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit a doped polysilicon layer on an undoped polysilicon layer as taught by Eom in applicant's admitted prior art process to reduce gate oxide degradation.

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Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art and Schuegraf - US 2002/0086503.

Applicant's admitted prior art (Figs. 1A-1B and pages 1-2 of the specification discloses substantially the claimed invention by fabricating a flash memory device with a floating gate by depositing an N-type polysilicon layer on a tunnel oxide layer, an ONO layer on the floating gate, a control gate on the ONO layer, and performing a plurality of thermal processes. The admitted prior art does not disclose to deposit an undoped polysilicon layer on the tunnel oxide and a doped polysilicon layer on the undoped polysilicon layer. Schuegraf (Figs. 12-13 and text in paragraphs 58-64) teaches to form an undoped polysilicon layer 40 on the gate oxide 16e (analogous to the claimed tunnel oxide), and a doped polysilicon layer 42 on the undoped polysilicon layer to form a gate, and the thickness of each layer may be optimized as in paragraph 64.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit a doped polysilicon layer on an undoped polysilicon layer as taught by Schuegraf in applicant's admitted prior art process to improve gate oxide quality in flash devices.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tobin - US 4,914,046 , Ramsbey - US 5,981,364 , and Sekikawa - US 6,211,046 describe multiple polysilicon layers as the gate layer.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chandra Chaudhari whose telephone number is 571-272-1688. The examiner can normally be reached on Mon - Fri (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chandra Chaudhari

Primary Examiner

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Chandra Chaudhari

October 29, 2004